

Cargo Helicopters Parts Marking Program



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Just another Sling Load



Cargo PMO Objective

To enable logistics transformation and knowledge enabled business processes by comprehensively and intelligently establishing uniqueness and marking of weapon system spare and repair parts.



Establish the ability to manage components over the complete life cycle.



Why Mark Parts?

To reduce the maintenance burden on the soldier by:

- Providing consistency in data collection/management.
- Ensuring all maintenance-, transportation-, and supply-related processes can be captured electronically.
- Providing intelligent data for knowledge-enabled logistics.



Policy History

- 29 Jul 2003** “Policy for Unique Identification (UID) of Tangible Items – New Equipment, Major Modifications, and Reprocrements of Equipment and Spares”, signed by the Acting Under Secretary of Defense (Acquisition, Technology and Logistics)
- 25 Nov 2003** Version 1.3 of policy
- 26 Nov 2003** Update – Clarification of Issues Raised
- 22 Dec 2003** Update – Issuing Agency Code for AI/DI use of CAGE
- 15 Dec 2003** OSD et al Teleconference allowing TS 21849 Text Element Identifiers

Department of Defense Guide to Uniquely Identifying Items



Assuring Valuation, Accountability and Control of Government Property

Version 1.3
November 25, 2003

Office of the Principal Deputy Under Secretary of Defense
(Acquisition, Technology & Logistics)

<http://www.acq.osd.mil/uid>



The Facts

- UID Policy accepts AIs, DIs, TEIs.
- The collaborative solution permits a wide range of commercial solutions.
- UID Policy covers all commodities.
 - A single solution does not cover all instances.
- UID Policy accepts two valid constructs.
 - Construct choice impacts:
 - Information systems.
 - User training processes.
 - Commercial processes.



Collaborative Solution

Using a standard ISO “wrapper”, commercial (ATA Spec 2000), ANSI MH-10.8, and UCC/EAN formats can be used to construct valid UIDs.

- ISO/IEC 15434 **Syntax** as standard format

Text Element Identifiers:

[>^R_S **DD**^G_S **MFR** 0CVA5^G_S **SER** 674A36458^R_S ^E_O^T

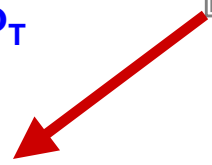
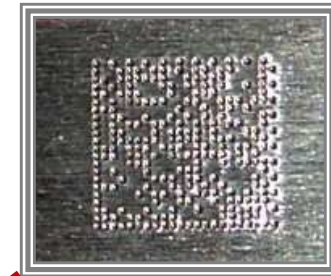
EAN.UCC: Application Identifiers

[>^R_S **05**^G_S **8004**06141411A0B9C3D6^R_S ^E_O^T

MH 10.8.2: Data Identifiers

[>^R_S **06**^G_S **17V**0CVA5^G_S **1P**1234^G_S **S**786950^R_S ^E_O^T

(2-digit numeric format code requested of SC 31 to replace DD)



Where are we now?



Interoperability across DoD

- Components cross service lines.
- Depots service weapon systems for multiple service customers.
- Information systems must feed common DoD registry.
- UID data elements.
 - Clear and unambiguous across enterprise.



Army SNT - DA Form 2410

COMPONENT REMOVAL AND REPAIR/OVERHAUL RECORD						REQUIREMENT CONTROL SYMBOL	
For use of this form, see DA PAM 738-751; the proponent agency is DCSLOG						CSGLD-1052(R3)	
SECTION I - IDENTIFICATION							
CONTROL NUMBER 624882		1. NOMENCLATURE Engine Gas Turbine		2. NSN 2840-01-070-1003		3. PART NUMBER 6035T00G01	
4. SERIAL NUMBER GEE306591		5. CAGE CODE 99207		6. NO. OF PREV O/Hs CC		7. TIME SINCE LAST INST (HRS) 350 0	
8. TIME SINCE NEW (HRS) 2766 2769		9. TIME SINCE OVERHAUL (HRS) CC		10. FAILURE CODE 317 99			
11. POS 1		12. HSF		13. METER HRS 0-4		14. WUC 0-4	
15. COMPONENT CUMULATIVE COUNT/HOURS							
a. LCF 1		b. LCF 2		c. TTI		d. OP HRS	
16. APU SSN		17. APU HRS		18. APU SSO		19. VERSION	
1 0 4 9		7 3 2 3		8 3 0		2 7 9	
1 0 4 7		7 3 1 7		8 1 8		2 7 6	
SECTION II - REPAIR/OVERHAUL/GAIN							
20. REMOVED FROM (NOMEN NHA)				21. NSN (NHA)		22. PART NUMBER (NHA)	
23. SERIAL NUMBER (NHA)				24. HOURS (NHA) 1385		25. NHA CUMULATIVE COUNT/HOURS	
26. APU START METER				27. APU HOUR METER		28. HISTORY RECORDER SN ECD03595	
29. HISTORY RECORDER READING				30. ACFT MODEL UH-60A		31. ACFT S/N 8023426	
a. LCF 1				b. LCF 2		c. TTI	
2 7 2				1 6 0 3		1 4 7	
2 7 2				1 5 9 7		1 3 5	
2 7 2				1 5 9 7		1 3 5	
32. MAINT LEVEL 0				33. UIC (This Action) WOWFAA		34. UIC (This Action) WOWFAA	
39. DATE CHECKED 96185				40. PID AND TELEPHONE NUMBER AW0980 DSN 861-2361		41. UIC WOM	
43. INSPECTION AND ACTION CODES				44. REASON FOR GAIN		45. MANHOURS TO REPAIR/OVERHAUL 203	
(A) SERV				(E) REPAIR		(G) REBUILT	
(B) UNSERV				(D) REMFG		(F) O/HAUL	
47. ACT FAIL CODE 317				48. SRA/ESRA N			
REMARKS Total cumulative counts and hours calculated by WOWFAA due to history recorder failure.							

Serial
Number

Part
Number

CAGE
Code

Navy SNT – NALCOMIS OMA

NALCOMIS OMA

File Window Help

Active Work Order Query

ORG: WVA7

BUNO/SERNO: 164

WUC/UNS:

MCN:

Work Order Update - Removed

MCH: 00002NI WUC/UNS: 1513500 Mal Cd: 374 Pos Cd: RED Buno/Serno: 164176

REMOVED

Cage: 07450 Part Number: 01-21551B42

Serno: 2163211 Date Removed: 17 JAN 2001

CDI Signature:

Cancel Apply

Sort By

Ready | (0104 | User OTTA

Serial Number

Part Number

CAGE Code

Air Force SNT – Form GO-81

AMC Graphical User Interface on LYNX - [G081 Session]

File View Connection Options Window Help

PA1 PA2 Send/Enter Disconnect Clear Screen Text Screen GUI Screen G081 Help

Screen 9021

Serial Number

Part Number

CAGE Code

MAMU9021 ON-LINE SICR PROGRAM

TRANSACTION S PASSWORD CEI MC0637D SERIAL NUMBER 0000000938

PART NUMBER 2248000-41 NHA CEI MA0001D NHA SERIAL NUMBER 0001000193

LOCATION CODE DKFX AF ACCEPTANCE DATE 02289 CAGE CODE 98571 STATUS M

TOTAL HOURS 01791.9 TOTAL CYCLES TSOH 01782.7 CSOH

TOTAL ENGINE FLIGHTS 000000 TOTAL LANDINGS 000619 ID NUMBER

LAST OVERHAUL AGENCY DATE LAST OVERHAUL TSO LAST INSPECTION

DATE LAST OIL CHANGE DATE OIL SAMPLE TAKEN DATE INSTALL 02198

CONFIGURED ARTICLE C WUC/REFDES 3133RC001 MADAR BOLT # POSITION

DATE OF LAST STATUS CHANGE 02198 % OF EXTENDED LIFE BUILD INTVL

WARRANTY DATE WARRANTY INDICATOR N CONTRACT # CFE

ADJUST CYCLES BY (EX: 0000012) ADJUST HOURS BY (EX: 00012.5)

VALID TRANSACTIONS: A-ADD, C-CHANGE, D-DELETE, S-SCAN, F-FIX LINKAGE PROBLEMS,
Y-ADD HRS/CYS TO ENG COMPONENTS, Z-SUBTRACT HRS/CYS FROM ENG COMPONENTS.
ALL DATES ARE JULIAN (POSITION YEAR AND 3 POSITION DAY).
ALL FIELDS USING HOURS ARE OF THE FORMAT 99999.9. YOU TYPE IN THE DECIMAL.
ADJUST CYCLES ARE HHHH FOR C17, ALL OTHERS ARE 9999999 WITH NO DECIMAL.

ACTIVITY ACCEPTED

Ready...

Start Inbox - Microsoft ... ATMGOV AMC Portal - Nets... Microsoft Outlook AMC Graphical U... 21:40 Zulu 1:41 PM



DoD Policy Guidance

	UID Construct #1	UID Construct #2
Based on current enterprise configurations	If items are serialized within the Enterprise	If items are serialized within Part Number
UID is derived by concatenating the data elements IN ORDER:	Issuing Agency Code* Enterprise ID Serial Number	Issuing Agency Code* Enterprise ID Original Part Number Serial Number
Data Identified on Assets Not Part of the UID (Separate Identifier)	Current Part Number	Current Part Number
*The Issuing Agency Code (IAC) represents the registration authority that issued the enterprise identifier (e.g., Dun and Bradstreet, EAN.UCC). The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.		



How did the Cargo PMO select a path forward?



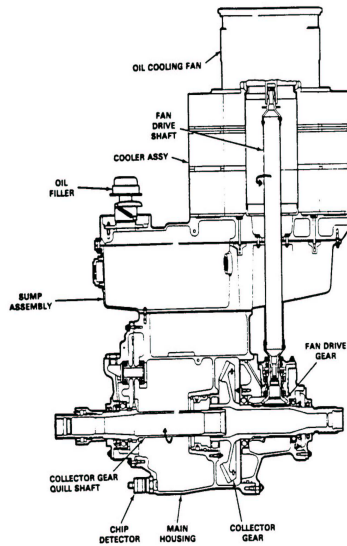
Issues to Address

Existing Parts that are currently serialized.

1. Apply MRC with existing data on part.
 - Easiest solution.
 - Is the data unique?
 - There are known duplicates out there but no one knows how many.
 - Which construct to use?
 - Legacy EID and government SNT must verify serialization standard.
 - Most solutions follow construct 2.
2. Apply a UID with MRC. (serialize within Government CAGE)
 - Replace existing data (EID, Serial Number) when mark is registered.
 - Guarantees uniqueness.
 - SNT registry provides link to existing info.
 - Permits either construct.



Cargo PMO Example of Marking



CH-47 Combiner Transmission

NSN	P/N
1615-01-397-9921	145D5300-20
1615-01-315-9365	145D5300-20
1615-01-464-3974	145D5300-16
1615-01-315-4069	145D5300-11
1615-01-310-4980	145D5300-11
1615-01-310-4981	145D5300-11
1615-01-312-2390	145D5300-9
1615-01-114-0850	145D5300-9
1615-01-216-3828	145D5300-3

Marking Scenario

Case	Current Part Number	Serial Number	
1	145D5300-11	02142004	New Part
2	145D5300-20	02142004	Modified New Part
3	145D5300-11	CH05681	Existing Part
4	145D5300-20	CH05681	Modified Existing Part



Semantics Definitions

- DI:** **Data Identifier** – ISO MH-10 marking standard
- 18S:** The data element that is made up of a serial number (unique within Enterprise ID) and an Enterprise ID.
- 17V:** Enterprise ID defined as CAGE code.
- S:** Serial number assigned by the enterprise ID
- 1P:** Original part number assigned by the enterprise ID
- 30P:** Current part number.
-
- TEI:** **Text Element Identifier** – ISO TS21849 marking standard.
- MFR:** Original Enterprise ID defined as manufacturer (CAGE).
- SER:** Serial number that is unique within the MFR.
- SPL:** Supplier Code - The Enterprise ID of an agency marking a part after original manufacturer.
- UCN:** Unique Component ID Number – A serial number unique within the SPL.
- PNR:** Current part number.



Combiner Transmission Construct #2 Utilizing DIs

New Part

(17V) 77272 [Barcode] (S) 02142004 [Barcode] (1P) 145D5300-11 [Barcode]	[QR Code]
Combining Transmission (30P) 145D5300-11 [Barcode]	

4 Data
Elements

Modified New Part

(17V) 77272 [Barcode] (S) 02142004 [Barcode] (1P) 145D5300-11 [Barcode]	[QR Code]
Combining Transmission (30P) 145D5300-20 [Barcode]	

Existing Part

(17V) 58H12 [Barcode] (S) CH05681 [Barcode] (1P) 145D5300-11 [Barcode]	[QR Code]
Combining Transmission (30P) 145D5300-11 [Barcode]	

Marked using
Government Cage Code

Modified Existing Part

(17V) 58H12 [Barcode] (S) CH05681 [Barcode] (1P) 145D5300-11 [Barcode]	[QR Code]
Combining Transmission (30P) 145D5300-20 [Barcode]	

TEIs do not support Construct #2



Combiner Transmission Construct #1 Utilizing DIs

New Part



2 Data
Elements

Modified New Part



Existing Part



Marked using
Government Cage Code

Modified Existing Part



Combiner Transmission Construct #1 Utilizing TEIs

New Part

MFR 77272 SER 02152004	
Combining Transmission PNR 145D5300-11	

3 Data
Elements

Modified New Part

MFR 77272 SER 02152004	
Combining Transmission PNR 145D5300-20	

Existing Part

SPL 58H12 UCN CH05681	
Combining Transmission PNR 145D5300-11	

Marked using
Government Cage Code

Modified Existing Part

SPL 58H12 UCN CH05681	
Combining Transmission PNR 145D5300-20	



PM Cargo UID Solution – Construct 1

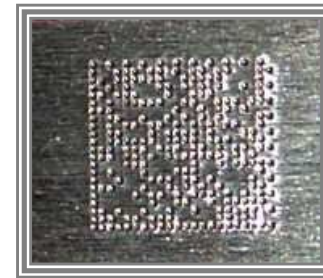
- 2-data element configuration for UID.
- Re-serialize existing parts with Government CAGE.
- Only current part number on label.
- Interoperable with current Information System.

- Real-estate permitting:
 - Linear machine-readable
 - 2D machine-readable
 - Human-readable
 - UID on one label
 - Current part number on a second label

Linear and 2D machine-readable and human-readable (incl. nomenclature)



2D machine-readable only



- Limited real-estate:
 - 2D machine-readable only



Industry Concerns



UID Impact

- Significantly more components require serialization.
 - Tracking
 - Provide government with serial number registry.
 - Traceability
 - Trace component from manufacturing raw materials.
- Many more requirements for serialization within manufacturing process.
 - Serialize within enterprise.
 - One source within enterprise for serial numbers.
 - Serialize within part number.
 - Each manufacturing process has its own serial number record and registry.
- Enterprise information processes must tie to DoD information processes.



Cargo PMO Implementation



Part List Development

- Prior to DoD UID Policy, Cargo PMO planned to mark RECAP/DLR components with machine-readable marks as part of CPME vision.
- DoD UID Policy came out requiring that all new production items be marked.
- To ensure common marking scheme on both legacy and new parts, Cargo PMO expanded parts marking list to include parts meeting DoD UID criteria.
 - Controlled Inventory (incl 2410-tracked items)
 - Over \$5000
- Facilitated team assembled to validate list of parts to be marked.



Engineering Analysis

- Determine location for mark on each part
- Determine type of mark on each part
 - Label
 - Direct Mark
- Validate location and type of mark for each part
 - Ensure *labels* are not in contact with aircraft fluids that will degrade adhesive
 - Ensure *direct marks* do not degrade parts
- Obtain Airworthiness Release (AWR)
- Incorporate approved marking instructions into appropriate documentation (field procedures, MEOs, etc.)



Parts Marking Strategies

- Opportunistic Parts Marking
 - Linked to program opportunities or long term maintenance
- Vendor Marked at Source
 - Marks applied by vendor during manufacturing/overhaul process
- Intercept Gate Parts Marking
 - Intercept gates set up within the supply chain
- Seek and Mark Parts Marking
 - Interest in single type component world-wide



OPM Sites

CONUS

Ft Lewis OLR

WA USAR - Ft Lewis - 11A/C
CA ARNG - Stockton - 8 A/C
IA ARNG - Davenport - 7 A/C
HI USARPAC - Wheeler AAF - 8 A/C
HI ARNG - Wheeler AAF - 14 A/C

Ft Hood OLR/DOL

OK ARNG - Lexington - 6 A/C
TX ARNG - Grand Prairie - 8 A/C

Ft. Rucker – PBL
34 A/C

Corpus Christi Army Depot
RECAP 54 A/C

Ft Campbell OLR/ALMD

101st - Ft Campbell - 49 A/C
IL ARNG - Peoria - 7 A/C
AL ARNG - Birmingham - 7 A/C

Ft Bragg OLR/DOL

C/2/159 – Ft Bragg – 8 A/C

Hunter AAF OLR/DOL

B/2/159 - Hunter AAF - 14 A/C
GA ARNG - Hunter AAF - 7 A/C
PA ARNG - Annville - 7 A/C
CT ARNG - Windsor Locks - 7 A/C
VA USAR - Ft Eustis - 4 A/C

- ☆ Governing RESET SITE
- ◇ Unit RESET SITE
- RECAP Site
- PBL Site

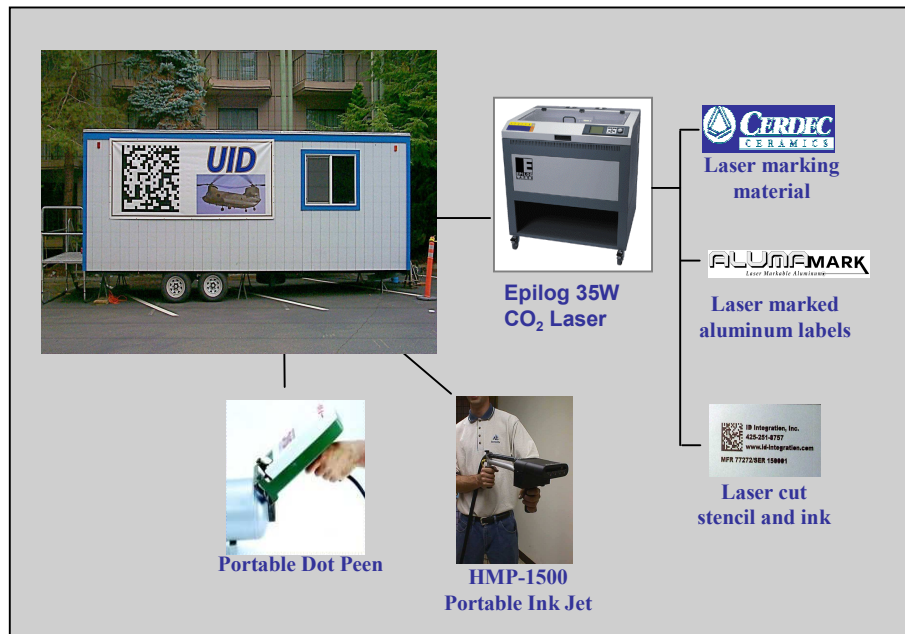
Germany OLR

F/159 - Geiblestadt - 7 A/C
F/159 - Coleman BKS - 7 A/C

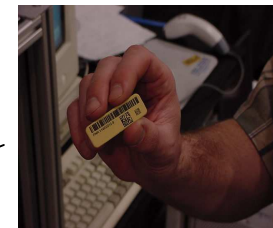
OCONUS

OPM Mobile Package

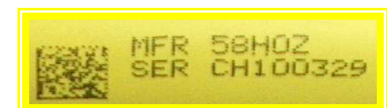
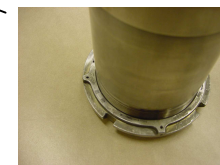
- Provide on-site capability to mark approved parts and assemblies
- Dedicated equipment usage personnel
 - Provided by PM Cargo for 1 year
 - Training provided by PM Cargo for long-term operator



Labels



Direct Marking



Lessons Learned

- Develop initial list from most current platform data (RPSTL, PMR, etc.) and build from there.
- Ensure that all known alternate part numbers are included on list.
- Determine all organizations affected and gain their participation from process initiation.
 - Include Vendors and OEMs.
- Determine approach for marking instructions that will accommodate all potential marking enterprises.



Summary – Current Status

- Initial list of “parts to mark” developed.
- RESET subset established (985 part numbers, 499 parts).
- 187 part numbers in AWR approval cycle.
- Parts marking process documentation in development.
- Marked initial RESET aircraft at Ft. Campbell.
 - 11 parts on A/C 8424154
 - 11 parts on A/C 8900130



Questions?



Back-up Charts



Marking Instructions

Near Term (Resulting from Parts Marking Workshop)

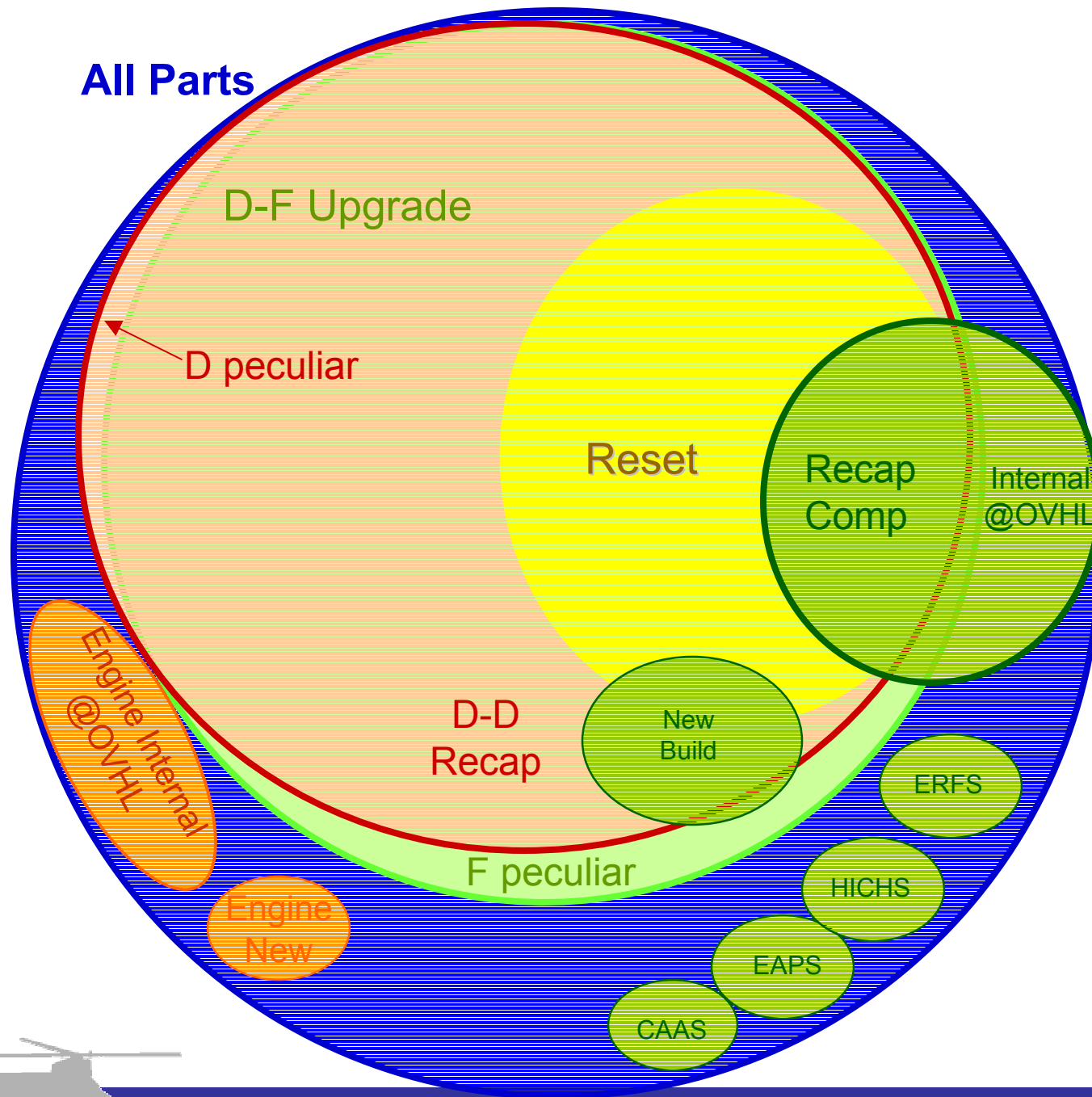
- One-page marking instruction per part
 - Provides cleaning instructions
 - Provides sketch with location of mark on part
 - Provides method of marking (label, laser-etch, etc.)
- Parts Marking MEOs included in DMWRs

Long Term

- Electronic instructions developed (E-cards)

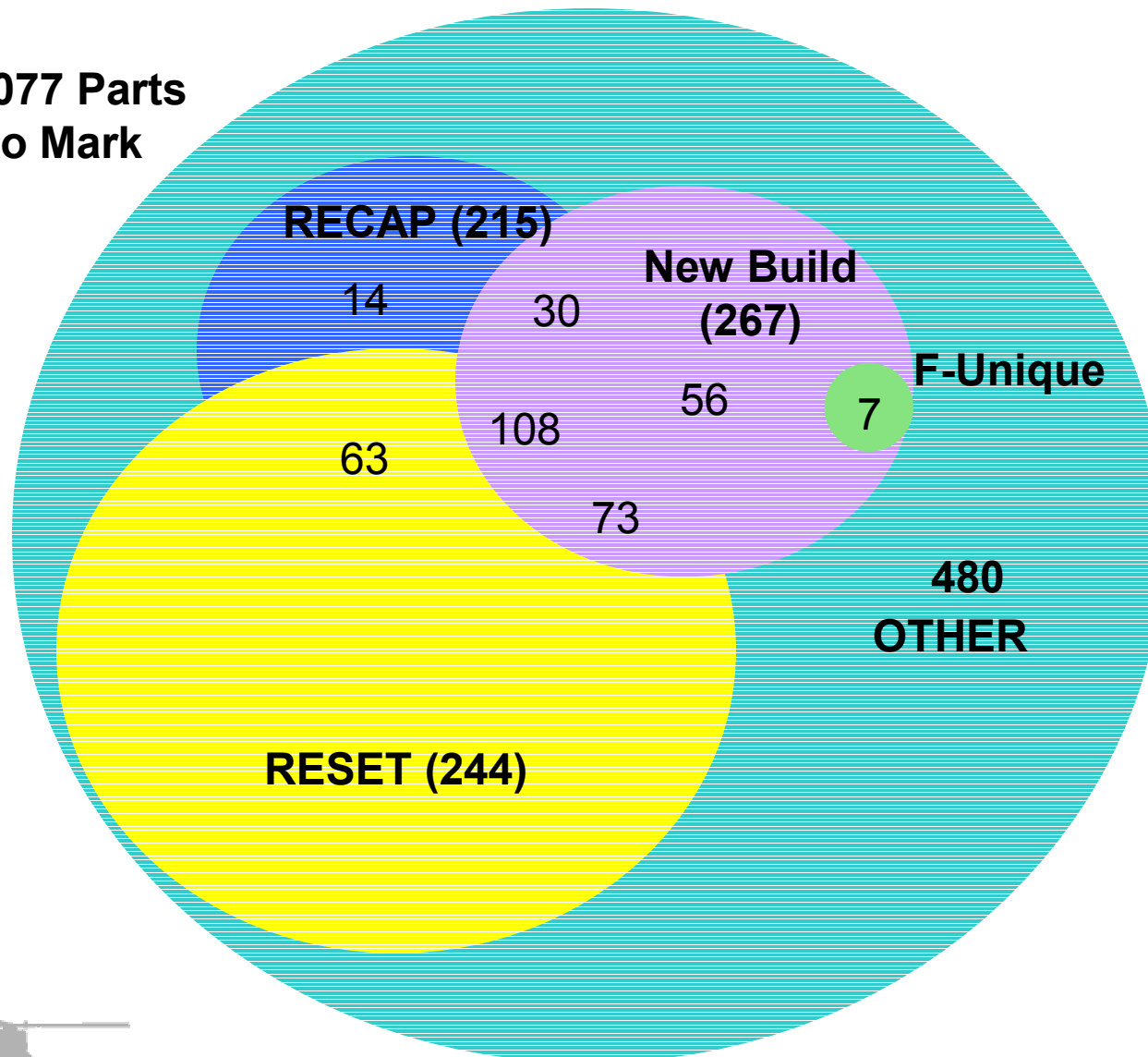


All Parts



Geographic Marking Breakdown

To Date: 1077 Parts
Identified to Mark



Opportunistic Parts Marking

- On-Aircraft
 - RESET (Aircraft coming back from SWA)
 - CH-47F Remanufacture Program (Boeing)
 - Recapitalization (CCAD)
- Components/Parts
 - At Vendor / OEM
 - During Depot Overhaul
 - At Supply Chain Gates



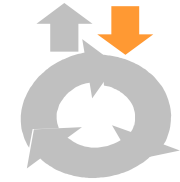
Path Ahead

- Refine total parts list (RCM Team)
- Complete initial instructions for RESET
- Field additional OPM equipment
- Complete engineering analysis on total parts list
- Obtain approval to mark remaining parts
- Mark parts! ☺

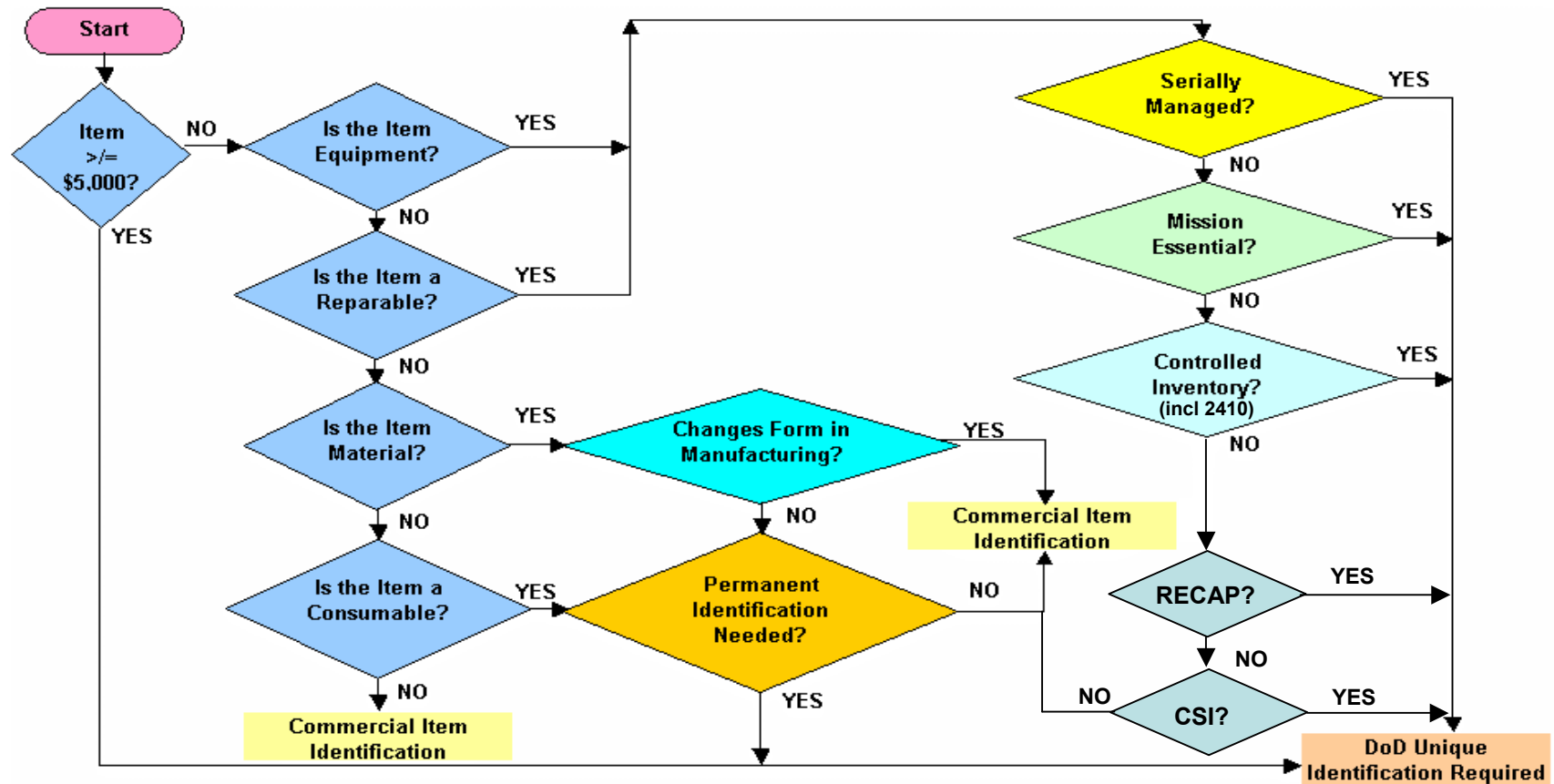




UID Decision Criteria



Which Items Require a Unique Identifier (UID)?



DoD Unique Identification (UID)

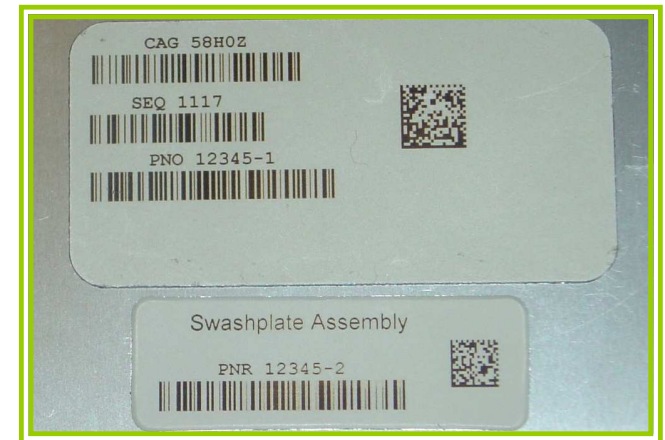
Construct #1

- Serialized within enterprise
- UID comprises 2 data elements
 - ✓ Enterprise code number
 - ✓ Unique serial number



Construct #2

- Serialized within part number
- UID comprises 3 data elements
 - ✓ Enterprise code number
 - ✓ Unique serial number
 - ✓ Original part number





UID Collaborative Solution Issue

- Using the **syntax** of ISO/IEC 15434, the collaborative solution provides for three interoperable formats:

Formats:

(2-digit numeric format code requested of SC 31 to replace DD)

Text Element Identifiers:

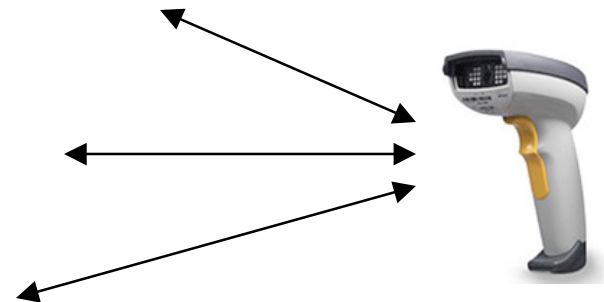
[>^R_S**DD**^G_S**MFR** 0CVA5^G_S**SER** 674A36458^R_S^E_O^T

EAN.UCC: Application Identifiers

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MH 10.8.2: Data Identifiers

[>^R_S**06**^G_S**17V**0CVA5^G_S**1P**1234^G_S**S**786950^R_S^E_O^T



- Until SC 31 assigns a format code for use of TEIs use interim DoD format code “DD” in ISO/IEC 15434 syntax



Draft Algorithm

